

What is claimed is:

1. A positioning apparatus, comprising:

a process chamber exposed under reduced pressure;

5 a first casing having a first guide face that has a first opening communicating with inside of the process chamber;

a moving block movable in at least one direction and opposed to said first guide face through a predetermined gap;

a second casing including:

10 a second guide face being on the other side of the moving block via the moving block, and guiding in a state that the second guide face is opposed to the moving block through a predetermined gap; and

a decompression chamber whose internal pressure is 15 lower than a pressure of an outside of the process chamber;

a first differential pumping seal including a plurality of stages, provided between the first casing and the moving block to surround the first opening and sealing between an inside of the process chamber and an outside of said process chamber, 20 wherein a pressure of the outside of the process chamber is higher than that of the inside of the process chamber; and

a seal mechanism for maintaining an inside of the decompression chamber at a pressure that is lower than that of an outside of the decompression chamber, 25 wherein a stage of the first differential pumping seal, which

is most far from said process chamber, and the inside of the decompression chamber are connected to a same exhaust source.

2. A positioning apparatus, comprising:

5 a process chamber exposed under reduced pressure;

a first casing having a first guide face that has a first opening communicating with inside of the process chamber;

a moving block movable in at least one direction and opposed to said first guide face through a predetermined gap;

10 a second casing including:

a second guide face being on the other side of the moving block via the moving block, and guiding in a state that the second guide face is opposed to the moving block through a predetermined gap; and

15 a decompression chamber whose internal pressure is lower than a pressure of an outside of the process chamber;

a first differential pumping seal including a plurality of stages, provided between the first casing and the moving block to surround the first opening and sealing between an inside
20 of the process chamber and an outside of said process chamber, wherein a pressure of the outside of the process chamber is higher than that of the inside of the process chamber; and

a seal mechanism for maintaining an inside of the decompression chamber at a pressure that is lower than that
25 of an outside of the decompression chamber,

wherein control device controls the gap between the first guide face and the moving block in accordance with an operating condition of at least one of the first differential pumping seal and the seal mechanism.

5

3. The positioning apparatus according to claim 2, wherein

the seal mechanism is a second differential pumping seal which is provided on opposed faces of said second guide surface and said moving block, wherein

the second differential pumping seal seals between the inside of the decompression chamber and the outside of the decompression chamber, and wherein

the control device controls an internal pressure of piping, through which the first and second exhaust seals are connected to an exhaust sources.

4. The positioning apparatus according to claim 2, wherein

the first differential pumping seal has two or more stages, wherein

the second differential pumping seal has a single stage, and wherein

one of the stages of the first differential pumping seal, which is most far from said process chamber, and said second

differential pumping seal are connected to a same exhaust source.

5. The positioning apparatus according to claim 1,
wherein the moving block is supported with respect to said first
5 casing and said second casing by a hydrostatic bearing or a
magnetic bearing.

6. The positioning apparatus according to claim 3,
wherein
10 the first differential pumping seal has two or more stages,
wherein
the second differential has a single stage, and wherein
one of the stages of the first differential pumping seal,
which is most far from said process chamber, and said second
15 differential pumping seal are connected to a same exhaust source.

7. The positioning apparatus according to claim 2,
wherein the moving block is supported with respect to said first
casing and said second casing by a hydrostatic bearing or a
20 magnetic bearing.

8. The positioning apparatus according to claim 3,
wherein the moving block is supported with respect to said first
casing and said second casing by a hydrostatic bearing or a
25 magnetic bearing.

9. The positioning apparatus according to claim 5, wherein the hydrostatic bearing or the magnetic bearing are adjustable to support the moving block with respect to said first casing and said second casing.

5

10. The positioning apparatus according to claim 7, wherein the hydrostatic bearing or the magnetic bearing are adjustable to support the moving block with respect to said first casing and said second casing.

10